

EXAMPLE SCENARIO 11

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

The Dean Company

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Resident	Adult	Aquifer 1 - Tap Water	CW	Chemical Concentration in Water	See Table 3.1	mg/l	See Table 3.1	Chronic Daily Intake (CDI) (mg/kg/day) = CW x IR-W x EF x ED x 1/BW x 1/AT
				IR-W	Ingestion Rate of Water	2	l/day	EPA, 1991	
				EF	Exposure frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
		Child	Aquifer 1 - Tap Water	AT-C	Averaging Time - Cancer	25,550	days	EPA, 1989a	Intake (pCi) = CWR x IR x EF x ED
				AT-N	Averaging Time - Non-Cancer	8,760	days	EPA, 1989a	
				CWR	Radionuclide Concentration in Water	See Table 3.1	pCi/l	See Table 3.1	
				IR-W	Ingestion Rate of Water	2	l/day	EPA, 1991	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	CDI (mg/kg/day) = CW x IR-W x EF x ED x 1/BW x 1/AT
				CW	Chemical Concentration in Water	See Table 3.1	mg/l	See Table 3.1	
				IR-W	Ingestion Rate of Water	1	l/day	EPA, 1989b	
				EF	Exposure frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	Intake (pCi) = CWR x IR x EF x ED
				AT-C	Averaging Time - Cancer	25,550	days	EPA, 1989a	
				AT-N	Averaging Time - Non-Cancer	2,190	days	EPA, 1989a	
				CWR	Radionuclide Concentration in Water	See Table 3.1	pCi/l	See Table 3.1	
				IR-W	Ingestion Rate of Water	1	l/day	EPA, 1991	
				EF	Exposure Frequency	350	days/year	EPA, 1991	CDI (mg/kg/day) = CW x IR-W x EF x ED x 1/BW x 1/AT
				ED	Exposure Duration	6	years	EPA, 1991	

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Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Dermal	Resident	Adult	Aquifer 1 - Tap Water	CW FA Kp SA tau-event t-event B EV EF ED CF BW AT-C AT-N	Chemical Concentration in Water Fraction Absorbed Water Permeability Constant Skin Surface Area Lag time per event Event Duration Ratio of permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis Event Frequency Exposure Frequency Exposure Duration Volumetric Conversion Factor for Water Body Weight Averaging Time - Cancer Averaging Time - Non-Cancer	See Table 3.1 Chemical Specific Chemical Specific 18,000 Chemical Specific 0.58 Chemical Specific 1 350 24 0.001 70 25,550 8,760	mg/l -- cm/hr cm ² hours/event hours/event -- events/day days/year years l/cm ³ kg days days	See Table 3.1 EPA, 2001 EPA, 2001 EPA, 2001 EPA, 2001 EPA, 2001 EPA, 2001 EPA, 2001 EPA, 2001 EPA, 1991 -- EPA, 2001 EPA, 2001	Dermally Absorbed Dose (DAD) (mg/kg-day) = DA-event x EV x ED x EF x SA x 1/BW x 1/AT where for organic compounds, Absorbed Dose per Event (DA-event) (mg/cm ² -event) = 2 FA x Kp x CW x CF x SQRT((6 x tau-event x t-event)/pi) or DA-event = FA x Kp x CW x ((t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B)) + (3 x B x B))/(1 + B) ²) and where for inorganic compounds, DA-event = Kp x CW x CF x t-event

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Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Dermal (continued)	Resident (continued)	Child	Aquifer 1 - Tap Water	CW FA Kp SA tau-event t-event B EV EF ED CF BW AT-C AT-N	Chemical Concentration in Water Fraction Absorbed Water Permeability Constant Skin Surface Area Lag time per event Event Duration Ratio of permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis Event Frequency Exposure Frequency Exposure Duration Volumetric Conversion Factor for Water Body Weight Averaging Time - Cancer Averaging Time - Non-Cancer	See Table 3.1 Chemical Specific Chemical Specific 6,600 Chemical Specific 1 Chemical Specific	mg/l -- cm/hr cm ² hours/event hours/event --	See Table 3.1 EPA, 2001 EPA, 2001 EPA, 2001 EPA, 2001 EPA, 2001 EPA, 2001	DAD (mg/kg-day) = DA-event x EV x ED x EF x SA x 1/BW x 1/AT where for organic compounds, DA-event (mg/cm ² -event) = 2 FA x Kp x CW x CF x SQRT((6 x tau-event x t-event)/pi) or DA-event = FA x Kp x CW x ((t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 x B x B))/(1 + B) ²) and where for inorganic compounds, DA-event = Kp x CW x CF x t-event

EPA 1989a: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual, Part A. OERR EPA/540/1-89/002.

EPA 1989b: Exposure Factors Handbook, July 1989, EPA/600/8-89/043.

EPA 1991: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER 9285.6-03.

EPA 1992: Dermal Exposure Assessment: Principles and Applications. EPA/600/8-91/011B.

EPA 1997: Exposure Factors Handbook, Volume 1. EPA/600/P-95/002Fa.

EPA 2001: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim.